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ABSTRACT

Although academic achievement and self-concept of academic ability (SCAA) have a reciprocal relationship, studies on the directionality of the relationship are inconclusive. To investigate this relationship in an entire grade cohort in a small city high school, 429 students in grades 9 and 12 were administered a modified version of Brookover's Self-Concept of Academic Ability Scale. Grade point averages (GPA) from school records and standardized test scores for 96 of the 429 students were collected. An analysis of the results showed that grade 9 GPA had a significant effect on grade 12 SCAA in the comprehensive (non-college preparatory) schools. However, the causal patterns were different in the exclusive, college preparatory school where frequency of communication with teachers, parents, and peers seemed to play an important role in SCAA. Grades affected grade 12 SCAA only when they were the primary indicator of teachers' perceptions of students' academic ability. Standardized achievement tests were not significantly related to SCAA. The data suggest that a skills-enhancement approach will be the most effective way to increase achievement and that visible feedback through a number of channels will increase students' SCAA. (BL)

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Academic Achievement and Self-Concept of Academic Ability: A Four-Year Longitudinal Study

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Academic Achievement and Self-Concept of Academic Ability: A Four-Year Longitudinal Study

Abstract

A study of the relationship between academic achievement (GPA) and self-concept of academic ability (SCAA) in an entire grade cohort of a small city high school system (n=429). All students in the system were administered the SCAA scale in grades nine and twelve; GPA data were collected from school records. Structural relationships were analyzed using LISREL. Grade 9 GPA was found to have a significant effect on grade 12 SCAA. However, the causal patterns were different in the exclusive, college preparatory school than in the other schools. Standardized achievement tests were not significantly related to SCAA.

Academic Achievement and Self-Concept of Academic Ability:
A Four-Year Longitudinal Study

The construct of self-concept of academic ability (SCAA) has been of interest to educational researchers for decades. Much of the research on this construct has focused on whether SCAA causes or is caused by academic achievement. The relationship is clearly reciprocal, but which direction is causally predominant? Most studies in the past two decades have concluded that academic achievement is causally predominant over SCAA (Bridgeman & Shipman, 1978; Caslyn & Kenny, 1977; Revicki, 1982; Rogers, Smith, & Coleman, 1978; Schierer & Kraut, 1979). Only one recent study (Shavelson & Bolus, 1982) has concluded that the predominance runs in the opposite direction.

The studies just cited, however, have methodological weaknesses which limit the generalizability of their findings. Some had relatively small samples, others collected data within relatively short time periods, and others used statistical techniques poorly suited to determining causality. The current study has been designed to overcome these weaknesses. The sample is large (n=429) and representative of an entire city school system, data were collected over a four-year period (grades 9 through 12), and the statistical analysis is designed to determine causality.

Method

Sample

The sample consisted of one complete grade cohort of a small urban school district. A total of 1854 students entered the city high schools in the Fall of 1975. Of these, 806 graduated four years later, in the Spring of 1979. Complete data were available for 429 of the 806 graduates (53%). Table 1 displays demographic characteristics of the total population and of the students for whom complete data were available.

Insert Table 1 about here.

The loss of nearly half the sample over the four years is unfortunate, but inevitable in a four-year study in a school system where approximately one-quarter of the student body is absent each day. The attrition rate was kept to only 47% by several measures, including two makeup administrations of each questionnaire and dogged perseverance in collecting data from school records.

Additional data were collected from a subset of the total sample, randomly selected during the first year of the study. Specifically, standardized test data were available for students in the subset, but not for all students. Of the 190

graduating students in the subset, complete data were available for 96 (51%). One of the analyses which follows includes standardized test data, and is based only on these 96 students.

There are four public high schools in the city. One is a college preparatory school, to which students are admitted only by examination. The other three are comprehensive high schools. One of the analyses which follows examines the causal patterns separately for the two types of school.

Instruments

Self-concept of academic ability was measured with a modified form of Brookover's Self-Concept of Academic Ability Scale (SCAA) (Brookover, Thomas, & Paterson, 1964). The scale consists of eight items, each with a five-point response scale. Of the eight items on the Brookover scale, three were replaced with items similar to the originals, but more appropriate for the population under study. One item on the original scale, for example, asks: "When you finish high school, will you be one of the best students, about the same as most, or below most of the students?" Since over half the students in this school system do not graduate, the item was replaced with the question: "Do you think that you have the ability to finish high school?" A questionnaire containing the SCAA was administered to all students in the sample in

November of the ninth grade and in April of the twelth grade. The reliability of the revised scale, estimated with Cronbach's alpha, was .72.

Academic achievement was estimated by grade point average (GPA), taken from school records. GPA was measured on the traditional 4.0 to 0.0 scale. For students in the subset, standardized achievement test data were also available: the California Achievement Test (CAT), Level Five, Form B, taken by all students in grade nine, and the Comprehensive Test of Basic Skills (CTBS),Level 4, Form T, administered only to students in the subset in grade 12. Reading and Math scales of each test were used as indicators of achievement. The CAT and CTBS were developed by the same publisher (McGraw-Hill) and are almost identical in format. Correlations between scales on the two tests range from .70 to .95 (Buros, 1972, p. 20).

Results

Earlier studies of the reciprocal relationship between achievement and self-concept have used cross-lagged panel correlations (Kenny, 1973) to determine causal predominance. However, there are serious conceptual problems with this procedure (Rogosa, 1980). Accordingly, the LISREL statistical program (Joreskog & Sorbom, 1978) was used to analyze the covariance structure of the data.

Three analyses were conducted. First, the structural relationships between SCAA and GPA at the two time periods were examined for all students. Second, the same analysis was repeated for the two types of school (examination school vs. comprehensive schools). Finally, an analysis including standardized test data was conducted for all students in the subset.

The abbreviated model of the analysis for all schools combined is shown in Table 2. Of interest are the coefficients relating SCAA9 with GPA12 and GPA9 with SCAA12. There is a significant difference between these two coefficients ($p<.05$). GPA9 has a significant effect on SCAA12, but SCAA9 has no noticable effect on GPA12.

Insert Table 2 about here.

Abbreviated models from the analysis by type of school are displayed in Table 3. These show significant differences in the patterns at the two types of school. GPA9 has a significant effect on SCAA12 only in the comprehensive schools. In the examination school, which had a strong press for academic achievement, GPA9 had little effect on SCAA12. Presumably other factors in the school affected SCAA12 more.

Data on some likely factors were available from three items on student questionnaires. The items asked students to rate frequency of communication with teachers, parents, and peers on a five-point scale. The responses of the students at the different schools indicated that teachers at the examination school gave students more day-to-day feedback on academic progress than did teachers at the other schools (2.7 vs. 1.9, $p < .05$), parents of students at the examination school inquired more often about schoolwork than did parents of students at other schools (2.9 vs. 2.1, $p < .05$), and students discussed schoolwork with friends more often at the examination school than at the other schools (3.2 vs. 2.7, $p < .01$).

Insert Table 3 about here.

The abbreviated model of the analysis including standardized test scores is displayed in Table 4. Once again, only GPA9 has a significant effect on SCAA12; achievement as measured by standardized tests had no significant effect on SCAA12.

Insert Table 4 about here.

In secondary analyses, no significant differences in structural patterns were found between male and female students, black and white students, or students from different socio-economic strata.

Discussion

The findings of this study support those of earlier studies (Caslyn & Kenny, 1977; Rogers, et al., 1978; Scheirer & Kraut, 1979): GPA has a stronger causal effect on self-concept than vice versa. But how should GPA be interpreted? As an objective indication of academic ability, or as the subjective evaluation of teachers? Caslyn and Kenny (1977) chose the former interpretation. Two aspects of the data from this study, however, support the latter interpretation, which is consistent with a symbolic interactionist perspective (Brookover, et al., 1964). Standardized tests, which are objective indicators of academic ability, had little effect on SCAA12. And at the examination school, where the evaluations of friends and parents and teachers were communicated in ways other than grades, GPA9 had little effect on SCAA12. Grades affected SCAA12 only when they were the primary indicator of the teachers' perceptions of students' academic ability. This

finding suggests that grades affect self-concept only to the extent that they communicate the teacher's evaluation of the student's ability. If other assessments of ability are communicated in the school setting, grades become relatively unimportant determinants of self-concept.

However, the data offer little support for self-enhancement approaches to school intervention. Initial self-concept had no effect on later achievement, measured either by grades or standardized tests. In this respect, the data suggest that a skills-enhancement approach will be the most effective way to increase students' achievement. If one also wants to increase students' self-concept of academic ability, this can be accomplished by frequent and visible feedback through a number of channels, including grades, teacher comments, peer comments, and parent comments.

Note

The data for this study were collected by Professors Jeff Schneider, John Glasheen, and Danny Hadley while they were at the Education Department of Brown University. The author acknowledges with thanks their permission to use the data. Special thanks are extended to John Glasheen for his comments on the manuscript.

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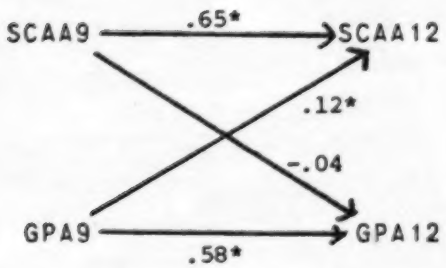
Table 1. Demographic Characteristics

	Entering Class	Graduating Class	Complete Data
Male	899	334	166
Female	955	472	263
White	1575	552	368
Black	279	144	61
High SES	371	171	99
Mid SES	760	295	147
Low SES	723	340	183
TOTAL	1854	806	429

Table 2. Structural Model: All Students



*p<.05

Table 3a. Structural Model: Examination School

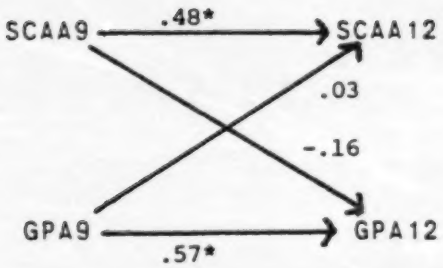
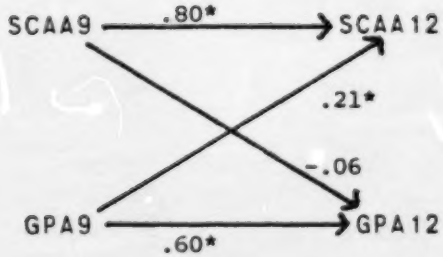


Table 3b. Structural Model: Comprehensive Schools



*p<.05